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TECHNICAL NOTES

NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

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No. 652

TABLES OF STIFFNESS AND CARRY-OVER FACTOR

FOR STRUCTURAL MEMBERS UNDER AXIAL LOAD

By Eugene E. Lundquist and W. D. Kroll Langley Memorial Aeronautical Laboratory

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SUMMARY

Tables of stiffness and carry-over factor are presented for members in which the cross section and axial load do not vary along the length of the member. These tables are of use in solving problems in the stability of structural members under axial load as well as in applications of the Cross method of moment distribution when the effects of axial load in the members are considered. The interval between successive values of the argument is small enough to make interpolation unnecessary in engineering calculations.

INTRODUCTION

The method of moment distribution developed by Hardy Cross (reference 1) can irrequently be used to advantage in the stress analysis of continuous beams, continuous frames, and rigid joint trusses, some cases of which occur in aeronautical structures. In reference 2 James summarized the principles of the Cross method and extended it to show how the effects of axial load in the members may be considered in a moment-distribution analysis. In reference 3 the Cross method was further extended to show how the principles of moment distribution may be used to solve problems in the stability of atructural members under axial load.

In the stability calculations as well as in a moment-distribution analysis where the effects of axial load are considered, it is desirable to have tables giving the stiff-ness and carry-over factor as a function of the axial load and properties of the member. Such a set of tables is oresented in this paper.

The tables apply to members for which the cross section and axial load do not vary along the length of the member. The interval between successive values of the argument was made so small that no interpolation will be necessary when the tables are used in engineering calculations.

DEFINITIONS AND SYMBOLS

The following definitions of stiffness and carry-over factor are the same as those given in reference 3, which parallel the definitions given in references 1 and 2 with some changes in wording.

Stiffness

If a member is on unyielding supports at each end, the moment at one end necessary to produce a rotation of one-fourth radian of that end is called the "stiffness." The stiffness of a member will depend upon the amount of restraint at the far end. In the derivation of the criterion for stability as given in reference 3, three types of restraint at the far end are considered. The symbols used to designate the stiffness for the different types of restraint are:

- S, far end fixed.
- Si. far end elastically restrained.
- S", far end pinned.

The stiffness of a member computed according to the foregoing definition is one-fourth that computed according to the definition given in references 1 and 2. In the Cross method the relative stiffness of the members is of importance and not the absolute value. The foregoing definition was selected so that the stiffness of a member of constant cross section with no axial load and fixed at the far end would be EI/L instead of 4EI/L.

Carry-Over Factor

If a member is on unyielding supports at each end and

a moment is applied at the near end, the ratio of the moment developed at the far end to the moment applied at the near end is called the "carry-over factor." As in the case of stiffness, the carry-over factor will depend upon the degree of restraint at the far end of the member. The symbols used to designate the carry-over factor for the different types of restraint are:

- C, far end fixed.
- C:, far end elastically restrained.
- $C^{n} = 0$, far end pinned.

Sign Convention

The sign convention used in this report is the same as that used in references 2 and 3. A clockwise moment acting on the end of a member is positive. A counter-clockwise moment acting on a joint is positive. An external moment applied at a joint is considered to act on the joint.

Symbols

- E, modulus of elasticity.
- E, effective modulus of elasticity.
- I, moment of inertia of cross section of member about a centroidal axis normal to the plane of bending.
- L, length of member.
- P, axial load in member (absolute value).

$$\alpha = 6 \frac{\frac{L}{j} \csc \frac{L}{j} - 1}{\left(\frac{L}{j}\right)^{2}}$$

$$\beta = 3 \frac{1 - \frac{L}{j} \cot \frac{L}{j}}{\left(\frac{L}{j}\right)^{2}}$$
For compression members

$$\alpha = 6 \frac{\frac{L}{j} \operatorname{csch} \frac{L}{j} - 1}{-\left(\frac{L}{j}\right)^{3}}$$

$$\beta = 3 \frac{1 - \frac{L}{j} \operatorname{coth} \frac{L}{j}}{-\left(\frac{L}{j}\right)^{2}}$$

$$j = \sqrt{\frac{EI}{P}}$$

$$\frac{L}{j} = L \sqrt{\frac{P}{EI}}$$

$$= L \sqrt{\frac{P}{EI}}$$

Effective values of α and β are obtained by substitution of $\left(L/j\right)_{\mbox{eff}}$ for L/j .

FORMULAS USED IN CALCULATION OF TABLES

In tables I and II for compression and tension, respectively, the far end of the member is considered as either pinned or fixed. The stiffness and carry-over factor that applies when the far end is elastically restrained is expressed in terms of these quantities by formulas given in reference 3.

The argument in tables I and II is $(L/j)_{eff}$. In the elastic range $\overline{E}=E$ and $(L/j)_{eff}=(L/j)$. Above the elastic range, however, it is necessary to use a reduced modulus \overline{E} , which is called the "effective modulus." In reference 3 it is shown how the effective modulus can be

obtained from the accepted column formula for the material comprising the member.

The second, third, and fourth columns in tables I and II were computed by means of the following formulas:

$$C = \frac{\alpha}{2\beta} \tag{1}$$

$$\frac{S^{\parallel}}{\left(\frac{\overline{E}I}{T_{\star}}\right)} = \frac{3}{4\beta} \tag{2}$$

$$\frac{S}{\left(\frac{\overline{E}I}{L}\right)} = \frac{S"}{\left(\frac{\overline{E}I}{L}\right)} \left[\frac{1}{1-C^2}\right] \tag{3}$$

These equations were first presented by James in reference 2 except that the more general form of equation (3) is taken from reference 3.

The last two columns in tables I and II were obtained from the preceding columns as indicated by their headings. These columns are included because of their convenience in stability calculations (reference 3).

ACCURACY OF TABLES

The tables of reference 4 were used in the preparation of tables I and II. All calculations were made using eight significant figures. Equations (1), (2), and (3) were used in the form and order given to calculate the second, third, and fourth columns. The fifth column was obtained by squaring the second column. The sixth column was obtained by squaring the fourth column and multiplying by the fifth column. The last column was therefore made to depend upon all preceding columns. All values were then tabulated to six significant figures and the differences for the last

column were studied; in some cases as much as the fourth difference was used. An independent check was also made for a series of values throughout the tables as well as where errors were suggested by irregular differences. In each case where errors were suspected, they were traced to the tables of reference 4.

Langley Memorial Aeronautical Laboratory,
National Advisory Committee for Aeronautics,
Langley Field, Va., May 12, 1938.

REFERENCES

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- 2. James, Benjamin Wylie: Principal Effects of Axial Load on Moment-Distribution Analysis of Rigid Structures. T.N. No. 534, N.A.C.A., 1935.
- 3. Lundquist, Eugene E.: Stability of Structural Members under Axial Load. T.N. No. 617, N.A.C.A., 1937.
- 4. Hayashi, Kelichi: Sieben- und mehrstellige Tafeln der Kresi- und Hyperbelfunktionen und deren Produckte sowie der Gammafunktion. Julius Springer (Berlin), 1926.

TABLE I

		COMP	RESSION		
(<u>Ļ</u>)	С	$\frac{S''}{\left(\frac{EI}{I}\right)}$	S ŒI\	C²	S ² C ²
(j) eff			(1)		(士)
0	0.500000	0.750000	1.000000	0.250000	0.250000
-1	. 500243	.749505	.999664	.250243	.260075
.2	.501001	.747996	.998663	.251002	.250332
.3	.502260	.745488	.996996	.252265	. 250752
.4	.504034	.741963	.994656	.254050	.251342
.5	.506333	.737410	.991639	. 256375	.252104
.6	.509178	,131812	.987943	.259257	.253043
.7	.512572	.725149	.983561	262750	. 254163
.8	.514565	.717398	.978486	.266BZ9	.255471
.9	.521146	.708 <i>52</i> 8	.972709	.271593	.256971
1.0	.524380	.698505	.966221	.277075	.258673
1.01	,52.69.40	-697458	.965532	.277665	.258854
1.02	.527506	.696358	.964837	.275263	.259038
1.03	.528080	.695267	.964134	.278869	.259224
1.04	.528661	.694164	.963424	279452	.259411
1.05	.529249	.693049	.962707	. 250104	,259602
1.06	.529848	.691921	.961952	.280734	.259794
1.07	.530445	.490782	.961250	.281372	.259958
1.05	.531054	.689630	,960511	.282015	.260155
1.09	.551669	.488466	.959764	.282672	.260853
1.10	,532293	.687289	.959011	.283336	.260584
1.11	.532923	.686100	.958249	. 284007	.240787
1.12	.533561	.484899	.957481	.284687	.260992
1.13	.534205	.683685	.956705	.2553 <i>75</i>	.261250
1.14	,534855	.682459	.956922	.284078	.26/410
1.15	.535517	.681220	.955131	.266779	.261621
1.16	.536185	.679968	954835	.257474	.26/536
1.17	.534559	.678704	.955527	258215	.262052
1.18	. 537542	.677427	.952715	.265951	.242.271
1.19	.538232	.676137	.951894	.289693	.242492
1.20	.538929	.474834	.951066	270445	.242715
1.24	.539635	.673518	.950231	.291206	.263941
1.22	.540548	.672190	.949368	.291976	.863169
1.23	.541069	.670848	.948538	.292755	.263599
1.24	.541798	.669493	.947680	.293545	.263632
1.25	.542535	.668125	.946814	.294344	.263867
1.26	.543279	.666744	.945941	.295158	,264104
1.27	.544033	.665350	.945061	.295971	264544
1.28	.544794	,663942	.944173	.296800	.264586
1.29	.54.5568	.662521	.943277	.297639	.264830
1.30	.546341	.661086	.942374	.298488	265078
1.31	.547127	.657638	.941462	.299347	.145327
1.32	.547921	.658176	.940544	.300217	.265579
1.53	.548724	.656701	.989618	.501098	.245633
1.34	.549535	.655212	.958683	.301989	.266090
1.35	.550355	.653709	937742	302890	.266350
1.36	,551163	.652192	.936792	.303803	.266611
1.37	.552021	.650661	.935835	.304727	.266876
1.38	.552867	.649116	.954870	.305662	.247143
1.39	.553722	.647557	.953897	.306608	-267412
1.40	.554565	.645984	.932917	,307565	.267684

TABLE I (Continued) COMPRESSION

(L)	С	<u>S"</u> (<u>EI</u>)	(EI)	C 2	$\frac{S^2 C^2}{\left(\frac{\overline{E} I}{L}\right)^2}$
1.41	.555458	.644397	,431428	.308554	.247959
1,42	.556340	.442795	,930932	509515	.246234
1.43	.557231	.641179	.929928	.310507	.248516
1.44	.558132	.639549	1	,31000	.268798
1.45	.559041	.637903	.928916	} '	} i
1.46	.55 9961	.63 6244	.927896	.312.527	.267084
1.47		j	.926569	,313556	.269871
1.48	.540889	.634569	.925833	.314597	.264662
1.49	.561827	.632880 .631176	.924790	.315650	-269955
1.50	.562775	.629457	.925738	.316716	.270251
	.563733		.922679	.317794	.270650
1.51	.564700	.627723	.92(6)	.8/8886	.270851
1.52	.565677	,625973	.920536	.319990	.271156
1.53	566664	.624209	.919452	.321106	-271462
1.54	.567641	.622429	,918361	.322239	.271772
1.55	.568668	.620634	.917261	.323384	.272085
1.56	.569686	.616823	.916153	.324542	.172400
1.57	.570714	.616996	.915037	.325714	.272718
1.50	.571752	.615154	£19619.	.326901	.275040
1.59	.572801	.613296	.912761	,328101	.273364
1.60	.573861	.611423	.911641	.329316	.273691
1.61	,574931	.609533	.910492	.330544	.274021
1.62	.576012	.607627	.909335	-331790	.274354
1.63	.577104	.605705	.908170	.333049	.274690
1.64	.578207	.603766	.906997	.334328	.275029
1.65	.579321	.601812	.905815	.355613	.275371
1.66	.580444	.599840	.904425	,5367/8	.276716
1.67	.561563	.597853	.903427	.338237	.276064
1.68	.562731	.595848	.902220	.339576	.276415
1.69	.583891	.593626	.901005	.340929	.176769
1.70	.585062	.591788	.811781	.342298	.217126
1.71	.586245	.589752	.898549	.343684	.277487
1.72	.587440	.587660	.697308	.345086	.277851
1.13	.588648	.585570	.896060	.346506	.278218
1.74	.589867	.583462	.894802	.847943	.278586
1.75	.591098	.561337	.593536	.349397	.278961
1.76	.592342	.579194	.892261	.350869	.279335
1.77	.593598	.577034	.890978	.352359	.279717
1.78	.594868	.5748 <i>55</i>	.589666	.353847	101085.
1.79	.596149	.572659	.888366	.355394	.250457
1.80	.597444	.570444	.887077	.356939	.280877
1.81	.598752	.568211	.855759	.355504	.281271
1.82	.600075	.565960	.684432	. 340057	.281667
1.83	.601407	.563689	.683097	.361690	.282068
1.54	.602754	-561401	.881753	.363313	.252471
1.65	.604116	.559093	.880400	.364956	.282878
1.86	.605491	.554766	.879038	.866619	.283289
1.57	.606879	.554420	.877667	,34630£	.283703
1.68	.408282	.552055	.876288	_370007	.2841 £i
1.09	,609699	.549670	.874899	.371733	.254543

p.

	COMPRESSION						
$\left(\frac{L}{J}\right)_{eff}$	С	S' (EI)	S (EI)	C ²	S*C² (EI)²		
1-90	0.6((13)	0.547266	0.873502	0.373450	0.254965		
1.91	.612576	.544842	.672095	-375250	.285396		
1.92	.614037	.542398	.870680	.377041	285829		
1.95	.615512	.559953	.849255	.378855	.286265		
1.54	.617002	.537449	.567522	.380692	286705		
1.95	.618508	.534944	.564379	.382552	.257148		
1.96	.620028	.532419	.864927	.364435	.287596		
1.97	.621565	.529872	.863466	.386345	.205047		
1.95	,628117	.527505	.561996	.388274	.265502		
1.99	.624684	.524717	.860517	.390230	.288941		
2,00	.626268	.522107	.8590ZB	.592211	.289424		
2.01	.627868	.519476	.857530	,394218	,289891		
2.02	.629484	.5/4523	.856024	.374250	.290362		
2.03	.431117	.514149	.854506	,398307	. 2908 37		
2.04	.632767	.511452	.552980	.400393	.291316		
2,05	.634433	.505733	.85 1444	,402505	.291799		
2.06	.636117	.505992	.849899	.404645	.272286		
2.07	.657818	.503228	.848345	406812	.292778		
2.08	.439537	.500441	.844781	.409007	.295274		
2.09	.641273	.497631	.845207	.411231	.293778		
2.10	.443028	.494798	.848624	.413485	.294278		
2.11	.644500	.491942	.\$42031	.415768	.294786		
2.12	.646592	.489062	.840429	.418081	.295299		
2.13	.648401	.486157	.635516	420424	.295816		
2.14	.650230	.483229	.837194	.422799	.296338		
2.15	.6520 <i>18</i>	.450276	.835662	.425206	.296864		
2.16	.653945	.417299	.833921	.427644	.277394		
2.17	,655832	.474297	.832269	.430116	. 297929		
218	.657739	.471270	.830608	.482620	.275469		
2.19	.659666	-468217	.628937	.435159	.279018		
2.20	.61919	.465139	.827256	.437732	.299562		
2.21	.663581	.462036	.8255 4 4	.440339	.500[16		
222	.665570	.458906	.823862	.442763	.800674		
2.23	.667579	.455749	.822151	.445662	.301237		
2.24	-669611	.452566	.820429	.448378	.301805		
2.25	.671664	.449357	.818697	.451182	.302376		
2.26	.673759	.446120	.816955	.453924	.302756		
2.27	.675836	.442855	.815203	.466754	.303539		
2.28	.677956	.439568	.813446	.459624	.304127		
2.29	.680099	.456248	.811667	.462554	-304719		
2.30	.682265	.432895	.809584	.465485	,205317		
2.31	.684454	.429518	.805090	.468478	.305920		
2.32	.686668	. 426112	.8೦६೩8६	.471512	.306529		
2.33	.688905	-422677	.804471	.474590	.307142		
2.34	.691167	.419212	.802645	.477712	.307741		
2.55	.693454	.415716	.800809	-480878	.306385		
2.36	.695766	.412193	.798963	.454090	.309014		
2.37	.698103	.408638	.797105	.467846	.309649		
2.38	.700466	.40 50 51	.795237	.490653	.310290		
2.59	.702 8 56	.401434	.793356	.494006	.ep016.		
2.40	.70 <i>5</i> 272	-397785	.791468	.497409	.811587		

0

TABLE I (Continued) · COMPRESSION

(<u>\-</u>)	С	<u>s"</u> (<u>F.I</u>)	<u> 5</u> (타)	C ²	$\frac{S^2 C^2}{(\overline{E}.\overline{I})^2}$
eff		<u> </u>	L		
2.41		.394104	.789567	.500861 .	.312245
2.42	.710186	.390891	.187655	.504343	.512906
2.43	.712684	.354645	.785733	.507915	.513576
2.44	.715210	.352866	.783799	.5(1525	.314251
2.45	.717765	.379053	.781854	.515186	.314931
2.46	.720849	.3752.07	.779895	.51890£	.315617
2.47	.722962	.37/326	.777930	.522674	.816310
2.48	.725605	.367411	.775952	.524503	.317008
2.49	.728279	.363461	.773962	.530890	.3/77/3
2.50	.730983	.359475	.771961	.584356	.818423
2.51	.733718	.355453	.769948	,530342	.319140
2.52	.736465	.351394	.767924	.542410	.317563
2.53	.739284	.347299	.765888	.546541	.820593
2.54	.742116	.343167	.763841	.550736	.52/528
2.55	.744980	.335996	.761782	.554996	.322071
2.56	.747679	.334788	.759712	.559323	.322520
2.57	.750812	.330540	.757629	.543718	.325576
2.58	.753779	.326253	.755635	.565183	.114335
2.59	.756781	.321927	.753429	.572718	,326107
2.60	.759820	.317560	.751311	.577326	.325882
2.61	.762894	. 313152	.749/8/	.582008	.326665
2.62	.766006	.305763	.747040	.586765	.327455
2.63	.769155	.304211	.744685	.59/400	.325252
2.64	.772342	. 29 9678	.7427/9	.596513	.329055
2.45	.175568	.295101	.740541	.401506	.329866
2.66	.778634	.290480	.758350	.604582	.330685
247	.752159	.255615	.736147	.611742	.83/510
2.65	.785485	.281105	.733951	.616987	.332343
2.69	.788873	-276349	.751703	.622320	.335154
2.70	.792302	,271547	.729462	.627743	.534032
2.71	.795776	.266699	.727209	.4332.57	.334855
2.72	.79 1240	.261802	.724943	.635565	.335751
2.73	.602550	.256858	.722465	,644569	.536622
2.74	.606455	.251864	.720373	.650370	.337501
2.75	.01018.	.246520	-718069	.456272	.335389
2.76	.613505	.241727	.715751	.6622.76	.339284
2.77	.817548	.23458!	.713421	,648385	.340187
2.75	.821341	.231364	.711078	.674600	.341099
2.79	.825(82	.226154	.708721	.650926	.342019
2.80	.829074	.220831	,706351	.687364	.342947
2.51	.633017	.215473	.703765	.693717	.843865
2.52	.837011	,210060	.701571	.700587	,544830
2.83	.841057	.204590	.699161	.707478	.345785
2.54	,843158	.199064	.696737	.714292	.344748
2.55	.849313	.193479	.69 4300	.721332	.347720
2.86	.853523	.187836	.691549	.728502	.548701
2.87	.857790	.162133	.689384	,735804	.349691
2.88	.862115	.176369	.68 6906	.743242	.350691
2.69	.866498	.170543	.684413	.750819	.551699
1 1		1		1	1

W.A.C.A. Technical Note No.652

TABLE I (continued)

C E E E			ABLE I	(continue	sa j	
2.70	(1)		S*	S		52 C2
2.70	(누)	C	(EI)	/EI\	C ²	(EI\2
2.91	\J eff					
2.92	2.90	0.870941	0.164654	0.681906	0.758539	0.352716
2.93	2.91	.875446	. 158701	.679386	.766408	.353746
2.94 .089306 .140448 .671738 .790919 .356888 2.75 .094090 .134218 .669160 .791940 .351932 2.76 .098923 .127759 .66657 .60363 .357932 2.97 .903619 .121579 .66350 .35289 .361216 2.98 .908784 .113147 .661338 .825887 .361216 2.99 .135621 .108641 .650702 .335065 .362326 .300 .794715 .0954039 .65384 .85383 .364715 .301 .724115 .0954039 .65384 .85383 .364715 .302 .72418 .085606 .650701 .86433 .364715 .302 .72418 .061565 .648005 .57567 .36353 .364815 .303 .734708 .061565 .648005 .57567 .36353 .364025 .304 .731175 .0607270 .374029 .96573 .346221 .353505	2.92	.550012	. 152683	.676850	.774421	.854783
2.75 .894096 .134228 .669160 .779408 .357932 2.94 .99923 .127739 .66567 .800653 .359032 2.97 .903819 .121579 .665670 .81668 .360119 2.98 .905784 .113147 .661303 .825897 .361118 2.99 .13521 .108461 .658702 .835068 .362326 3.00 .19830 .102060 .65050 .844432 .844744 3.01 .724115 .0554037 .653304 .853988 .864715 3.02 .924572 .0886476 .650701 .863738 .346715 3.04 .440123 .044633 .64827 .85350 .364503 .364028 3.04 .44181 .0674637 .642565 .874173 .340228 3.07 .45186 .0674637 .642565 .874173 .370243 3.07 .45186 .057780 .437492 .47404 .372743 3.07	2.93	.884442	.146599	.674301	.782591	.355630 .
2.75 .89 4094 .154228 .649160 .779408 .357935 2.94 .898923 .127939 .663760 .850043 .357032 2.97 .903819 .121579 .663760 .816086 .36012 2.98 .908784 .115147 .663902 .353648 .361216 2.94 .913621 .108641 .665050 .044492 .54344 3.00 .918730 .102060 .656050 .044492 .54344 3.01 .924712 .0886498 .650701 .663738 .364715 3.02 .92472 .0886498 .650701 .663738 .364715 3.03 .924708 .0618568 .645005 .974079 .364203 .365715 3.04 .941023 .0747433 .645265 .894193 .364203 3.07 .95566 .0537850 .0537850 .375873 .37585 3.07 .92637 .046944 .947260 .374703 .375873 .375873	2.94	.559336	.140448	.671738	.790919	.356888
2.96 .098923 .127739 .666567 .508063 .357032 2.97 .903619 .121579 .663400 .61686 .360119 2.98 .908784 .115147 .661336 .352887 .361216 2.99 .913521 .108641 .653702 .335065 .322324 3.00 .918330 .102060 .656030 .844432 .563444 3.01 .924115 .0545037 .653384 .653985 .363444 3.02 .924708 .0518565 .645035 .657367 .366866 3.04 .940123 .0749633 .645292 .874173 .364505 3.04 .940123 .0749733 .642565 .874173 .367205 3.05 .945618 .0597850 .637063 .915873 .371585 3.07 .95656 .0597850 .637649 .925873 .371585 3.07 .95656 .0597850 .631449 .995873 .374014 3.07 .9565	2.95	.89 4096	,134228	.669160	.199408	
2.97 .903819 .121579 .663760 .316083 .360119 2.98 .905704 .115147 .66133 .325887 .361216 2.99 .913821 .108641 .650702 .335068 .362324 3.001 .924115 .0954037 .653384 .853985 .64375 3.02 .924172 .0886496 .650701 .643732 .363715 3.03 .934708 .0818565 .648085 .873679 .366025 3.04 .940123 .047433 .645292 .858530 .36025 3.05 .945618 .067879 .642565 .894193 .367205 3.06 .931195 .0507850 .637063 .915573 .362203 3.07 .945618 .05787850 .637063 .915573 .362203 3.07 .945618 .05787850 .637063 .915573 .362203 3.07 .945603 .057878 .637063 .915573 .372404 3.07 .94	2.96	.898923	.127959			
2.98 .908784 .115147 .661838 .025887 .361218 2.99 .91821 .102064 .685052 .835068 .362326 3.00 .928730 .102060 .685050 .844492 .853444 3.01 .92415 .0954037 .653304 .853985 .364715 3.02 .92472 .0886685 .650701 .663738 .365715 3.03 .934708 .0618568 .648005 .976278 .366068 3.04 .940123 .074937 .648285 .874193 .36008 3.05 .946185 .079879 .649222 .904772 .370387 3.06 .95195 .0597650 .637069 .91873 .371583 3.07 .75656 .0597650 .637069 .91873 .371583 3.07 .75656 .0597550 .631499 .957670 .574014 3.07 .756676 .057250 .631499 .957670 .574014 3.07 .756876	2.97	.903819	.121579	.663960	.814568	.360119
2.99	2.98	.905784	.115147	461838	.825889	
3.00	2.99	.913521	.10864[.835068	
3.01 .924115 .0954039 .653284 .853985 .364375 3.02 .924772 .0886648 .650701 .664322 .365715 3.03 .934708 .0618565 .648005 .573677 .566850 .348028 3.04 .940125 .0748433 .645292 .658530 .348028 3.05 .948418 .0079879 .642565 .894193 .349203 3.06 .95195 .0697290 .637083 .918573 .371585 3.06 .942605 .0465543 .634289 .904772 .370387 3.08 .942605 .0465543 .634289 .92604 .373745 3.07 .968437 .0372550 .631499 .927570 .374014 3.09 .968437 .0372550 .631499 .927570 .374491 3.10 .974360 .016257 .626944 .947316 .377491 3.11 .980375 .0243243 .625012 .92032 .9374491 <	3.00	.9(8930	.102040	.654050	.844432	.363444
3.02 .924772 .0884698 .650701 .865732 .365715 3.03 .934708 .0818568 .648005 .873679 .366866 3.04 .940123 .0749633 .645212 .858530 .360028 3.05 .945618 .0679879 .645265 .894193 .369208 3.06 .95195 .0609290 .639022 .904772 .370389 3.07 .956556 .0557850 .637043 .975873 .871585 3.08 .942603 .0445543 .634229 .925770 .374014 3.10 .974560 .0916257 .226644 .947376 .37249 3.11 .9780375 .0243243 .625872 .961135 .376491 3.12 .786485 .0167291 .623035 .973147 .377449 3.13 .992687 .00903818 .620182 .965427 .37021 3.14 .996987 .00903818 .620182 .965427 .37021 3.15 1.00539 .0044560 .617242 .997976 .880216 . 1.00000 0 .616550 1.00000 .880504 3.16 1.01189 .0144287 .611520 1.02292 .882703 3.17 1.01850 .0227226 .608578 1.03734 .836216 . 3.18 1.02521 .0050225 .60563 1.03734 .85556 .3805556 .3805556 .602708 1.05597 .886702 .386702 .321 .005897 .00474478 .597735 1.07496 .385556 .385556 .385556 .386602 .386602 .386602 .386602 .386602 .386602 .386602 .386602 .386602 .386703 .392308 .602708 1.05597 .386703 .386602 .386703 .392308 .602708 1.05597 .386703 .386503 .393344 .99354 .005877 .00468294 .593745 1.07496 .385556 .385556 .385556 .385556 .385556 .385556 .386503 .393344 .394601 .005897 .386602 .386703 .392308 .602708 1.06509 .386703 .394381 .005897 .00468294 .593745 1.07496 .385556	3.01					
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3.09				.634259	.926604	
3.10 .974360 .0510287 .628644 .947375 .375243 3.11 .980375 .0243243 .625872 .96135 .376491 3.12 .786485 .0167291 .623035 .973149 .577749 3.13 .492687 .00903815 .620182 .985427 .379021 3.14 .496987 .00124960 .617342 .97976 .880216 1 .00000 0 .616850 1.00000 .385504 3.15 1.00539 0063866 .614429 1.01080 .381602 3.17 1.01850 0146287 .611520 1.02392 .582703 3.18 1.02521 0307225 .605638 1.05106 .385556 3.19 1.03203 0372308 .602705 1.05509 .886902 3.20 1.03897 0474498 .594735 1.07445 .386263 3.21 1.04601 056161 .594750 1.04416 .367637 3.22 1.0	1 1		l	+	1	
3.11 .980375 .0243243 .625872 .96135 .376491 3.12 .786485 .0167291 .625035 .973149 .371749 3.13 .992687 .00903818 .620182 .985427 .379021 3.14 .998987 .00124960 .617242 .997976 .860216 T 1.00000 0 .616550 1.00000 .380504 3.15 1.00539 00663866 .614429 1.01080 .381602 3.16 1.01189 0146287 .611520 1.02392 .382703 3.18 1.02521 0507225 .60563 1.057106 .385556 5.19 1.03203 0272305 .602708 1.06509 .386902 3.20 1.03897 0476498 .594738 1.07945 .388263 3.21 1.04601 0561016 .594750 1.09416 .309457 3.22 1.03897 048294 .593745 1.10919 .391026 3.24 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td></td<>						
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3.14 .998987 .00124960 .617242 .997976 .880216 Tr 1.00000 0 .616850 1.00000 .380504 3.15 1.00539 00663866 .614429 1.01080 .381602 3.16 1.01189 0146287 .611520 1.02592 .582703 3.17 1.01850 022726 .608598 1.03734 .384221 3.18 1.02521 0309225 .605663 1.05106 .385556 5.19 1.03203 0392308 .602708 1.06509 .386902 3.20 1.03897 0476498 .594735 1.07445 .386263 3.21 1.04601 0561616 .594730 1.09416 .369657 3.22 1.05316 048294 .593745 1.10919 .391026 3.23 1.04046 0735951 .590723 1.14035 .393844 3.25 1.06787 0824816 .557685 1.14035 .393844 3.25	1					
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5.19 1.03203 0392305 .602705 1.06509 .886902 3-20 1.03897 0474498 .599738 1.07445 .365263 5.21 1.04601 0561016 .594750 1.0416 .307637 3.22 1.0531d 0648294 .593745 1.10919 .391026 3.24 1.06046 0735951 .590723 1.12455 .392428 3.24 1.06787 0824816 .557653 1.14035 .393544 3.25 1.07541 0914915 .584625 1.15650 .895275 3.26 1.08307 100628 .581551 1.17303 .396721 3.27 1.09086 109893 .576459 1.18778 .379658 3.28 1.09379 119290 .575348 1.20784 .397658 3.29 1.10686 128523 .57216 1.22513 .40149 3.30 1.1506 138494 .569072 1.24337 .402456 3.31	1 1					
3-20 1.03897 0476498 .594738 1.07445 .368263 5.21 1.04601 0561016 .594750 1.09416 .309637 3.22 1.0531d 0648294 .593745 1.10919 .391026 3.24 1.06046 0735951 .590723 1.12455 .392428 3.24 1.06787 0824816 .587683 1.14035 .393844 3.25 1.07541 0914915 .584625 1.15650 .895275 3.26 1.08397 100628 .581551 1.17303 .396721 3.27 1.09086 109893 .576459 1.18778 .376103 3.28 1.09379 119290 .575348 1.20734 .391658 3.29 1.10686 128523 .57216 1.22513 .401149 3.30 1.11506 138494 .569072 1.24337 .402456 3.31 1.12342 146307 .565906 1.26207 .404178 3.32	1 1					· ·
5.21 1.04601 0561616 .594750 1.04416 .369637 3.22 1.0531d 0648294 .593745 1.10919 .391026 3.25 1.06046 0735951 .590723 1.12456 .392428 3.24 1.06787 0824816 .587683 1.14035 .393844 3.25 1.07541 0914915 .584625 1.15650 .595275 3.26 1.08397 100628 .581581 1.17303 .396721 3.27 1.09086 109893 .576459 1.18778 .376103 3.28 1.09879 119290 .575348 1.20784 .391658 3.29 1.10686 128523 .57218 1.22513 .40149 3.30 1.1506 138494 .569072 1.24337 .402456 3.31 1.12342 146307 .565906 1.26207 .404178 3.32 1.13192 156246 .56272 1.36126 .405716 3.33	1 1	i	0476498			1
3.22 1.0531d 0648294 .593745 1.10919 .391026 3.2b 1.06046 0735951 .590723 1.12458 .392428 3.24 1.06787 0824816 .557683 1.14035 .393844 3.25 1.07541 0914915 .564625 1.15650 .895275 3.26 1.08307 100628 .581551 1.17303 .396721 3.27 1.09086 109893 .576459 1.18778 .376103 3.28 1.09879 119290 .575348 1.20784 .391658 3.29 1.10686 128523 .57218 1.22513 .40149 3.30 1.11506 138494 .569072 1.24337 .402456 3.31 1.12342 146307 .565906 1.26207 .404178 3.32 1.13192 156246 .562723 1.26126 .405716 3.33 1.14058 166372 .657520 1.30092 .401270 3.34						
3.2b 1.06046 0735951 .590723 1.12455 .392428 3.24 1.06787 0824816 .587683 1.14035 .393844 3.25 1.07541 0914915 .584625 1.16650 .595275 3.26 1.06507 100628 .581551 1.17303 .396721 3.27 1.09086 109893 .578459 1.18978 .376183 3.28 1.09879 119290 .575348 1.20784 .399658 3.29 1.10686 128523 .57216 1.22513 .401149 3.30 1.11506 138494 .569072 1.24337 .402456 3.31 1.12342 148307 .565906 1.26207 .404178 3.32 1.13192 156246 .562723 1.26126 .405716 3.33 1.14058 146372 .555202 1.30092 .407270 3.34 1.14939 178632 .554299 1.32111 .408841 3.35	1 1		1	1		
3.24 1.06787 08248/6 .587683 1.14035 .393844 3.25 1.07541 09149/5 .584625 1.18650 .593275 3.26 1.08307 100628 .581551 1.17303 .394721 3.27 1.09086 109893 .578459 1.18796 .376163 3.28 1.09879 119290 .575348 1.20784 .399658 3.29 1.10686 128523 .572216 1.22513 .401149 3.30 1.11506 138494 .569072 1.24337 .402456 3.51 1.12342 146307 .565906 1.26207 .404178 3.32 1.13192 155266 .562723 1.26126 .405716 3.33 1.14058 16372 .657520 1.30092 .407270 3.34 1.14939 178632 .552299 1.32111 .408841 3.35 1.15637 189047 .553058 1.34182 .410427 3.36	1 1					
3.25 1.07541 0914915 .584625 1.15650 .595275 3.26 1.08307 100628 .501551 1.17303 .94721 3.27 1.09086 109893 .578459 1.18778 .376183 3.28 1.09879 119290 .575348 1.20784 .399658 3.29 1.10686 128623 .572216 1.22513 .401149 3.30 1.11506 138494 .569072 1.24337 .402456 3.51 1.12342 146307 .565906 1.26207 .404178 3.32 1.13192 155246 .572723 1.26126 .405716 3.33 1.14058 146372 .657520 1.30092 .407270 3.34 1.14939 178632 .554299 1.32111 .408841 3.35 1.15637 189047 .559058 1.34182 .410427 3.36 1.16431 210362 .544521 1.36491 .413652 3.38 <	i			1		
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3.26 1.09879 119290 .575348 1.20784 .399658 3.27 1.10686 128523 .572216 1.22513 .401149 3.30 1.11506 138494 .569072 1.24337 .402456 3.51 1.12342 146307 .565906 1.26207 .404178 3.32 1.13192 155246 .522723 1.26125 .405716 3.33 1.14058 163372 .657520 1.30092 .407270 3.34 1.14939 176632 .554299 1.32111 .408841 3.35 1.15637 189047 .555058 1.34182 .410427 3.36 1.14751 199622 .549779 1.36305 .412031 3.37 1.17682 210362 .546521 1.36491 .413652 3.38 1.16431 221270 .545223 1.40733 .415290		1.08307		.581551		
3.26 1.09879 119290 .575348 1.20784 .399158 3.27 1.10686 128523 .572216 1.21513 .401149 3.30 1.11506 138494 .569072 1.24337 .402456 3.51 1.12342 148307 .563906 1.26207 .404178 5.32 1.13192 155246 .572723 1.28126 .405716 3.53 1.14058 166372 .657520 1.30092 .407270 3.34 1.14939 176632 .554299 1.32111 .408841 3.35 1.15637 189047 .555058 1.34182 .410427 3.36 1.16751 199622 .544719 1.36305 .412031 3.37 1.17682 210362 .546521 1.36491 .413652 3.38 1.16631 221270 .543223 1.40783 .415290	3.Z7	1.09086	109893	.578459	1-15778	.576163
3.30 1.16506 138494 .569072 1.24337 .402656 3.51 1.12342 148307 .565904 1.26207 .404178 5.32 1.13192 155246 .502723 1.26126 .405716 3.53 1.14058 165372 .557520 1.30092 .407270 3.34 1.14939 176632 .554299 1.32111 .408841 3.35 1.15837 189047 .555058 1.34182 .410427 3.36 1.14751 199622 .544719 1.36205 .412031 3.37 1.17662 210362 .546521 1.36491 .413652 3.38 1.16431 221270 .543223 1.40783 .415290	3.28	-			_	
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3.51 1.12342 148307 .565906 1.26207 .404178 5.32 1.13192 155266 .572723 1.26126 .405716 3.33 1.14058 165372 .557520 1.30072 .401270 3.34 1.14939 178632 .554299 1.32111 .408841 3.35 1.15837 189047 .553058 1.34182 .410427 3.36 1.16751 199622 .544799 1.3608 .412031 3.37 1.17662 210362 .546521 1.36491 .413652 3.38 1.16631 221270 .543223 1.40783 .415290	1 1					1 1
5.32 1.13192 155246 .502723 1.26125 .405716 3.33 1.14058 165372 .557520 1.30072 .407270 3.34 1.14939 178632 .554299 1.32111 .408841 3.35 1.15637 189047 .555058 1.34182 .410427 3.36 1.14751 199622 .544799 1.34088 .412031 3.37 1.17462 210362 .544521 1.36491 .413652 3.38 1.16431 221270 .545223 1.40783 .415290	3.51					
3.33 1.14058 16372 .557520 1.30092 .407270 3.34 1.14939 176632 .556299 1.32111 .408841 3.35 1.15837 189047 .559068 1.34182 .410427 3.36 1.16751 199622 .544799 1.36208 .412031 3.37 1.17682 210362 .546521 1.38491 .413652 3.30 1.16631 221270 .545223 1.40783 .415290	5.32	_				1 1
3.34 1.14939 178632 .554299 1.32111 .408841 3.35 1.15837 189047 .559068 1.34182 .410427 3.36 1.16751 199622 .549799 1.34205 .412031 3.37 1.17682 210362 .546521 1.38491 .413652 3.30 1.16631 221270 .545223 1.40783 .415290	3.33	1.14058				1 !
3.35 1.15837 189047 .559058 1.34182 .410427 3.36 1.16751 199622 .549799 1.36208 .412031 3.37 1.17682 210362 .546521 1.38491 .413652 3.38 1.16631 221270 .545223 1.40733 .415290	1 1				-	l
3.36 1.16751 199622 .544799 1.36208 .412031 3.37 1.17682 210262 .546521 1.38491 .413652 3.38 1.18631 221270 .545223 1.40733 .415290	1 1					! 1
3.37 1.17682 210362 .54652 1.3849 .413652 3.38 1.18631 221270 .545223 1.40733 .415290						
3.38 1.18631221270 .545223 1.40733 .415290	1		1			
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3.40 1.20582243607 .536569 1.46401 .416618	1 1				i	1 1

N.A.G.A. Technical Note No.653

TABLE I (continued)

					62.62
(<u>+</u>)	С	S" (ĒI)	<u>s</u> ÆI)	C ₅	Sz Cz (EI)z
\J /eff			(エ)		(-L/
3.41	1.21586	~.255047	.533212	1.47832	.4 20309
3.42	1.22610	266673	.529836	1.50351	.422018
3.43	1.23653	278491	.524438	1.52901	.423746
3.44	1.24717	290505	. 523021	1.55544	.425492
3.45	1.25802	302722	.519584	1.5826Z	.427257
3.46	1.26909	3/5/47	-516126	1.61060	.429041
3.47	1,25059	317785	.572648	1.48940	.430846
3.48	1,29192	340644	.509148	1.66905	.432670
3.49	1.30368	353728	.505627	1.69958	.434514
3.50	1.31569	367045	.502085	1.73104	.436378
5.51	1,32795	380602	.498522	1.74346	.438242
3,52	1.34048	394405	.494937	1,79688	-440168
3.53	1.35327	408463	.491830	1.83134	.442095
3.54	1.36634	422782	-467701	1.86689	.444044
8.55	1.37970	-,487371	.484051	1.90356	.446014
3.56	1.39335	- ,452258	.459377	1.94142	.448007
3.57	1,40731	467392	.476682	1,98051	450022
3.55	1.42158	452541	.472963	2.02089	.452061
3.59	1.43618	498597	.469222	2.06260	.454122
3.60	1.45111	514468	.465457	2.10572	.456207
3.61	1.46639	531064	.461670	2.15051	.458315
3.62	1.48204	547798	.457659	2.19643	.460448
3.63	1.49805	564879	. 454024	2.24416	.462606
3.64	1.51445	562821	-450165	2.29257	.464789
3.65	1.53126	600135	.446282	2.34474	.466997
3,66	1.54847	618335	.442375	2.39776	467231
3.47	1.56612	636934	.438443	2.45272	.47/49/
3.68	1.58420	655946	.434486	2.50971	.473776
3.67	1.60276	675387	.480505	2.54883	.476091
3.70	1.62179	695273	. 426498	2.63019	.476432
3.71	1,64131	715619	.422465	2.69391	.480801
3.72	1.66136	736445	.418407	2.76011	.483199
3.73	1.68194	757767	.414523	2.82873	.455628
3.74	1.70306	779606	410213	2,90049	.485080
3.75	1.72450	801952	.406077	2.97495	.490545
3.76	1.74718	824916	.401914	3.05247	.493080
3.77	1.77009	848432	.517743	3.13322	.495625
3.78	1.79371	87£553	.393506	3.21738	.495202
3.79	1.61601	697804	.3592.61	3.30514	.500510
3.80	1.64302	-,922712	.364967	3.39672	.503451
3.81	1.86878	948807	.280659	3.49234	.506124
3.82	1.69532	975617	.374840	3.67224	.500.24
3.63	1.92268	-1.00318	.372003	3.69669	.511570
3.64	1.95088	-1.03151	.367617	3.50695	.514345
3.85	1.97998	-1.05101	.36520Z	3.92034	1
3.86	201002	-1.09067	.358758	4.04017	.517154
3.57	2.04103	-1.12.159	1		1 1
i	2.01307	!	.354284	4.14581	.522679
3.88	201301	-1.15344	.374750	4.29763	.525797

W.A.C.A, Technical Note No.653

TABLE I (continued)

		TABLE I	(COULIUN	ea)	
(L) eff	С	<u>s"</u> (<u>EI</u>)	S (EI) L	. C.	S*C*
3.89	2.10619	-1.15625	0.345245	4.43405	0.528752
3.90	2.14045	-1.22015	.540650	4,58151	.531744
3.91	2.17589	-1,25511	.336085	4.73450	.534775
3.92	2.21259	-1.29121	.331458	4.89555	.537846
3.93	2.25061	-1,32852	.324799	5.06524	.540956
3.94	2.29002	- 1.34709	.322109	5.24419	.544107
3.95	2.33090	- 1.40701	.317386	5.43311	.547299
3.96	2.37334	-1.44834	.312431	5.63273	.550833
3.97	2.41741	-1.4916	.307848	5.64386	.553810
3.96	2.46328	-1,53556	.303022	6.06745	.557130
3.99	2.51088	-1.58163	.298167	6.30452	.560495
4.00	2.56049	-1.62948	.293279	6,55610	.568905
4.01	2.612.17	-1.67922	.268355	6,82343	.567861
4.02	2.66606	-1.73096	.283376	7.10787	.570863
4.03	2,72230	-1.75462	.278405	7.41090	.574413
4.04	2.75104	-1.64097	,273376	7.73415	.578011
4.05	2.84246	-1.89953	.266312	8.07955	.581659
4.06	2.90478	-1.96069	.263212	5.44909	.585356
4.07	2.97407	-2.02462	.258076	8.54510	.587105
4.05	3.04469	-2-09158	.252900	9.27016	.592906
4.09	3.1[855	-2.16163	.247689	9.72720	.576760
4.10	3,19680	-2.23517	.242439	10.2195	.600668
4.11	3.27885	-2.3/24/	.257151	10,7508	.604651
		-2.34866	,231824	11.9254	.608650
4.12	8.36532				
4,18	3,45656	-2.47924	.226457 .221051	11.9479	.612726
4.14	3.55804	- 2.56952	_ !		.61686! .621054
4.15	3.45515	-2.66491	.215605	13.5602	.62.5308
4.16		-2.76587			.629624
4.17	3.87843	-2.57290	.204590	15.0422	
4.16	4,00082	-2.98660	,199020	16.0065	.63400 3 .638445
4.19	4.15 30	-8.10762	.195408	16.2371	.642953
4.20	4.27073	-3.23670	.187753		.647527
4.21	4.42004	-3.37471	.182055	19.5367	
4.22	4.56031	-3.32261	,176813	20.9793	.652170 .654881
4.23	4.76260	-3.46(65	_}70527 _!64696	2.2.5891 24.8933	
4.24	4.13895	-3.65276			,661663
4.25	5-14045	-4.03787	.146520	26A2A3 26.7ZIS	.666517
4.26	5.35927	- 4.23656	.152697		
4.27	5.59774	-4.45701 -4.69564	.146988	31-2347 84.8233	.676448
4,26	5.85841	ļ	.140912	37.7634	.686684
4.29	6.14520	-4.95746 -5.24604	.134847	41.7508	.691721
4.30	6.46148	 	.12.8735		
4.31	6.61233	-5.56579	.122573	46.4079 51.8937	.702641
4.82	7.20372	-5.92207	.116362	56.4170	
4.33	7.64310	-6.32159	!		.718780
4.34	8.15764	-6.77281	.103787	66.2570	.719361
4.85	8.70595	-7.28654	.0974220	75.7936 87.5541	.726112
4.36	9.35704	-7.87684	.0910048	ĺ .	[
4.37	10.1137	-8.56231	.0845344	102.288	.730955
4.38	11.0040	-9.36812	.0760101 ,0714311	121.084	.742927
4.40	13.3549	-10.5292 -11.4953	.0647967	178.406	.749059
1 7.70	10.0007	- 11.4730	1 .~ + - 17 = 1	1 1101.400	1

TABLE I (continued)

				<u> </u>	
(<u>L</u>)	С	<u>S"</u> (<u>EI</u>)	(EI)	C ²	S ² C ² (EI) ²
4.41	14.9567	- 12.9404	.0581061	\$2.3.703	.755292
4.42	16.9926	-14-7783	.0513585	288.747	.761627
4.43	19.6708	-17.1948	.0445531	386.739	.765067
4.44	23.3522	-20.5151	.0376891	545.324	.974615
4.45	25.7300	- 25.3636	.030765b	885.413	.781272
4.46	37-3277	-33.1126	.0237817	137 3.35	.788041
4.47	53,2714	- 47.4793	.0167367	2837.84	.794925
4.48	92.9960	-83.2686	.00962948	5648.26	.801926
4.49	345.751	-328.750	.00245924	133774	.809047
4.50	-/39.£/3 -168.600	170.447	.00245924 7 492 0047 8848	35801.6 35801.6	.816271
4.51	-75.1658	68.2048	0 (2074)	5644.83	.823660
4.52	-46.8989	42.7873	0194392	2199.51	.631156
4.53	- 84.0630	31-1862	-,0268713	1161.65	.835787
4.54	-26.7689	24.5958	-,0348712	716.677	,846551
4.55	-22.0401	20.3312	0419402	485-765	.854452
4.56	-18.7317	17.3467	0495793	350.878	.862495
4.57	-16.2875	15.1406	0572895	265.183	.870682
4.58	-14,4080	13.4433	0650721	207.590	.879016
4.59	-12.9178	12.0966	~.0729281	166.871	.887502
4.60	-11.7074	11.0020	0808587	137.064	.896148
4.61	-10.7048	10.0945	0585651	114,593	.904948
4.62	-9.86073	9.32975	0969487	97.2340	.713906
4.63	-9.14036	8.67647	105110	83.5462	.923036
4.64	-8.51839 4	0.111.6	~.(15552	72.5630	.932337
4.65	-7.97597	7.61877	121674	63.6[6]	618149.
4.66	-7.49878	7.18447	130079	56.2316	.951469
4.67	-7.0757Z	6.79892	138 <i>56</i> 7	50.0459	.961307
4.68	-6.69811	6.45429	147141	44.8647	.471358
4.69	-6.35901	b.1443I	155801	40.4370	.981561
4.70	-6.05282	5.86397	164549	34.6367	.991984
4-71	-5.77499	5.60914	173886	33.3506	1.00261
4.72	- 5.52177	5.57645	182315	30.4899	1.01546
4.73	- 5.29003	5.16809	191886	27.9844	1.02450
4.74	-5.07716	4.96671	200452	25.7775	1.03\$77
4.75	-4.850%	4.76581	209664	28.8237	1.04727
4.76	-4.69954	4.61722	218974	22.0557	1.05900
4.77	-4.53132	4.46097	218383	29.5329	1.07097
4.76	- 4.37490	4.31534	237894	14.1398	1.05318
4.79	-4.22910	4.17924	247507	17.8853	1.09565
4.80	-4.09288	4.05174	257227	16.7516	1.10838
4.51	-5.96532	3.73202	26705\$	15.7237	1.12457
4.82	-3.64563	8.81957	276988	14.7589	1.13464
4.83	-3.73312	3.71315	287035	13.9362	1-14519
4.54	-3.62716	3.61280	ZR7196	13.1563	1.16208
4.85	-3.52721	3.51784	307471	12,4412	1.(7617
4.86	-8.43276	3.42781	317865	11.7837	1.19062
4.87	-3.34339	8.34252	328379	11.1762	1.20438
4.88	- 3.258 69	5.26102	339015	1912.01	1.22047

		TABLE I	Continu	eay	
		5"	S	_	5 * C *
(누)	С	(EI)	(EI)	C²	/EI\2
/J/eff					
4,89	-3.17533	3.16358	-0.349777	10.1016	1.23507
4.90	-3.10197	3.10973	360666	9.62219	1.25165
4,91	-3.02932	3.03919	871685	7.17680	1.26777
4.92	-2.96014	2.97175	362837	8.76244	1.28426
4.93	-2.89418	2.90717	-,394124	8.37428	1.30112
4.94	-2.83122	2.84587	-,405550	6.01563	1.51537
4.95	-2.77106	2.78587	417117	7.67886	1.33602
4.96	-2.71356	2.72880	428829	7.36339	1.35408
4.97	-2,65850	2.67393	440687	7.06763	1.37257
4.98	- 2.60576	2.62110	452697	6.78997	1,39150
4.99	-2.55519	2.57020	464860	6.52678	1,41088
5.00	-2.50666	2.52111	477180	6.26335	1.48973
5.01	-2.46006	2.47373	489661	6.05191	1,45196
5.02	-2.41528	2.42794	502307	5.83356	1.47188
5.03	-2.37222	2.58367	515120	5.62741	1.47323
5.04	-2.33272	2.34053	~.585106	5.43261	1.51510
5.05	-2.29067	2,29984	541267	5.14807	1.53752
5.06	-2.25241	2.25912	554607	5.07337	1,56352
5.07	-2.21534	2.22011	-,548132	4.90774	1.58407
	-2.27958	2.18225	581845	4.75057	1.60828
5.08		2.14547	- 595752	4.60129	1.62367
5.09	-2.14506		609855	4.45939	1.65855
5.10	-2.11173	2.10973		4.52440	1.68469
5.11	-2.07952	2.07496 2.04112	624161	4.19587	1.71152
5.12	-2.04636	ł	688675 663400	4.07341	1.71102
5.13	-2.01827	2.00517	l i	3.95465	1.76737
5.14	-1.95913	1.97606	665344 683511	5.54523	1.77644
5.15	-1.96098	1.94475	678906	3.73885	1.82632
5.16	~1.95361		i '	3.43721	1.85702
5.17	-1.90715	1.68436	-,714536	1	i
5.18	-1.68150	1.85526	780408	3.54004	1.85059
5.19	-1.85663	1.82681	746526	3.44707	1.92106
5.20	-1.83251	1.79898	762898	3,35809	1.95446
5.21	-1.80910	1.77176	779\$31	3.27286	1.48881
5.2.2	-1.78639	1.74513	796482	81171.6	2.02416
5.23	-1.76433	1.71904	813607	3.11286	2.06058
5.24	-1.74291	1.69549	831065	3.03773	2.09807 2.18668
5.25	-1.72210	1.66844	846813		2,17646
5.26	-1.70187	1.64358	866860	2.87636	2.17646
6.27	-1.68221	1.61978	685214	1	Z.2.1770 Z.2.5973
5.25	-1.66309	1.59614	905884	2.76586	•
5.29	-1.64449	1.51292	922879	2.70486	2.50332 2.34828
5.30	-1.62640	1.65011	942210	2.64518	2.37648
5.31	-1.60880	1.52769	-,961684 - 951814	2.55823 2.53386	2.44258
5.32	-1.59166	1.50565	951914	Ī	1
5.33	-1.57498	1.46378	-1.00231	2.48056	2,49203
5.34	-1.55873	1.46265	-1.02305	2,42765	2.54311
5.35	-1.54291	1,44166	-1.04424	2.38057	2,59587
5.36	-1.52750	1.42098	-1.06581	2.33315	2.65044
5.37	-1.51248	1.40062	-1.05778	2.28769	2.70665
5.38	-1.49784	1.38055	-1.11019	2.24358	2.76519
5.39	-1.46356	1.36077	→.13503	2.20100	2.82557
5.40	-1.46967	1.34126	-1.15634	2.15993	2.85807

H.A.C.A. Technical Note No.652

TABLE I (continued)

C			LY RTE T	Continu	647	
5.42 -1.4247	$\left(\frac{L}{J}\right)_{eff}$	С			C²	$\frac{S^2 C^2}{\left(\frac{EI}{L}\right)^2}$
5.43 -1.4279 1.28426 -1.21713 2.04487 2.08985 3.16126 5.44 -1.41741 1.24577 -1.25024 2.00985 3.16126 5.45 -1.34316 1.22440 -1.30062 1.74491 3.23106 5.47 -1.36145 1.21154 -1.3358 1.70048 3.37414 5.47 -1.35695 1.17640 -1.3653 1.70048 3.37414 5.44 -1.35695 1.17640 -1.3653 1.84474 3.4474 5.50 -1.34209 1.15811 -1.41816 1.0123 3.64478 5.50 -1.34768 1.14200 -1.44766 1.70066 3.74094 5.52 -1.32713 1.10206 -1.47166 1.74156 3.74094 5.52 -1.32713 1.10206 -1.47166 1.74156 3.74094 5.53 -1.31713 1.10206 -1.47166 1.74156 3.74094 5.53 -1.31713 1.10206 -1.57108 1.70207 4.05447 4.05447	5.41	-1.45611	1.32202	-1.18011	2.12.025	1.75276
5.43 -1.42797 1.28426 -1.21713 2.04487 2.08781 5.44 -1.41741 1.24577 -1.25024 1.74741 3.23607 5.45 -1.47614 1.22740 -1.30662 1.74491 3.23607 5.47 -1.36145 1.21154 -1.33585 1.70848 3.37414 5.47 -1.35695 1.17640 -1.36535 1.70848 3.37414 5.44 -1.35695 1.17640 -1.3653 1.84674 3.4474 5.50 -1.34209 1.15411 -1.41816 1.0173 3.45448 5.50 -1.33748 1.14200 -1.44766 1.7086 3.74094 5.52 -1.32713 1.10206 -1.47165 1.76125 3.84478 5.53 -1.31703 1.10208 -1.47165 1.76125 3.24494 5.53 -1.31703 1.10208 -1.47165 1.76125 3.24478 5.54 -1.30716 1.09166 -1.57107 1.43204 1.70847 4.05441 <tr< td=""><td>5.42</td><td>-144287</td><td></td><td></td><td></td><td></td></tr<>	5.42	-144287				
5.44 -1.4174 1.24577 -1.25442 2.00985 3.16136 5.45 -1.40514 1.22440 -1.25024 1.74741 3.23697 5.46 -1.3716 1.22440 -1.30525 1.90046 3.37414 5.47 -1.35615 1.21184 -1.33535 1.90046 3.37414 5.48 -1.37008 1.17387 -1.36115 1.87711 3.47715 5.47 -1.35675 1.17460 -1.38733 1.84474 3.84465 5.50 -1.34067 1.15200 -1.44766 1.78666 3.74094 5.51 -1.34713 1.12200 -1.44766 1.78666 3.74094 5.52 -1.3713 1.12200 -1.47765 1.9456 3.48496 5.53 -1.30716 1.09166 -1.54064 1.70667 4.05441 5.54 -1.30716 1.09166 -1.54044 1.70667 4.0541 5.55 -1.27853 1.07519 -1.57287 1.60358 4.16516 5.55	1		l .			
5.45 -1.40514 1.24748 -1.25024 1.77441 3.23407 5.44 -1.3716 1.22940 -1.30662 1.74090 3.31563 5.47 -1.35165 1.7387 -1.3515 1.70042 3.37414 5.47 -1.35695 1.1740 -1.36733 1.84474 3.64466 5.50 -1.34809 1.15711 -1.47161 1.07173 3.45478 5.51 -1.33748 1.14200 -1.47161 1.70064 3.74674 5.51 -1.33748 1.14200 -1.47165 1.76125 3.44478 5.52 -1.34713 1.13206 -1.47165 1.74125 3.44678 5.53 -1.30716 1.09166 -1.56044 1.70067 4.05447 5.54 -1.30716 1.09166 -1.57267 1.24356 4.16516 5.55 -1.24753 1.07567 -1.87267 1.63584 4.16516 5.55 -1.24753 1.07567 -1.87267 1.62526 4.16516 5.57	{ :	-				
5.44 -1.34316 1.22740 -1.30662 1.74090 3.31363 5.47 -1.35168 1.21134 -1.33535 1.90646 3.37444 5.48 -1.37008 1.17840 -1.38733 1.04474 3.44466 5.47 -1.35375 1.17400 -1.38733 1.04474 3.44466 5.50 -1.34809 1.15811 -1.41816 1.07133 3.45478 5.51 -1.33748 1.14200 -1.47165 1.76125 3.44478 5.52 -1.32713 1.10226 -1.50677 1.73456 3.44494 5.53 -1.30716 1.09166 -1.54044 1.70867 4.05441 5.55 -1.30716 1.09166 -1.54024 1.70867 4.0541 5.55 -1.24753 1.07587 -1.60618 1.45526 4.40077 5.56 -1.26971 1.02664 -1.47527 1.61302 4.5567 5.57 -1.26971 1.02664 -1.67527 1.61202 4.5567 5.59	1	!	!			
5.47 -1.35145 1.21154 -1.35358 1.90846 3.57414 5.48 -1.37008 1.17367 -1.34115 1.87171 2.47715 5.49 -1.35695 1.17640 -1.36133 1.84474 3.47715 5.50 -1.34709 1.15111 -1.41616 1.91733 3.4694 5.51 -1.3713 1.12200 -1.44766 1.76864 3.74694 5.52 -1.3713 1.10828 -1.56077 1.74456 3.44672 5.53 -1.30716 1.09166 -1.54044 1.70887 4.05441 5.54 -1.30716 1.07166 -1.57267 1.4356 4.05441 5.55 -1.26812 1.07587 -1.57267 1.60358 4.16516 5.55 -1.27533 1.07587 -1.57267 1.60358 4.16516 5.55 -1.26121 1.05587 -1.57267 1.42027 1.60358 4.16516 5.56 -1.26812 1.07587 1.14027 1.53566 4.40079						
5.48 -1.37008	ļ.	•	1 1			
5.47 -1.58695 1.17640 -1.38933 1.84474 3.8446f 5.50 -1.34609 1.18911 -1.41616 1.0733 3.6449f 5.51 -1.53748 1.14200 -1.44766 1.78863 3.74044 5.52 -1.32715 1.13266 -1.47165 1.7125 3.94453 5.53 -1.31703 1.0028 -1.56044 1.70867 4.05441 5.54 -1.30716 1.09166 -1.54044 1.70867 4.05441 5.55 -1.27153 1.07519 -1.37287 1.60356 4.16516 5.56 -1.27894 1.04247 -1.40616 1.45726 4.2047 5.57 -1.26997 1.02664 -1.67527 1.61202 4.5677 5.57 -1.26121 1.01071 -1.71119 1.57052 4.56717 5.59 -1.22121 1.01071 -1.71119 1.57052 4.56717 5.60 -1.25431 .77930 -1.78544 1.54830 4.73845 5.61	1		1	1		
5.50 -1.34809 1.15911 -1.41816 1.01733 3.45476 5.51 -1.33748 1.14200 -1.44766 1.78086 3.74694 5.52 -1.32713 1.12566 -1.47185 1.7128 3.94674 5.53 -1.31703 1.10828 -1.50817 1.73456 3.94684 5.54 -1.30716 1.09166 -1.54044 1.70887 4.05461 5.55 -1.29753 1.07519 -1.37287 1.63358 4.16516 5.55 -1.29753 1.07519 -1.37287 1.63358 4.16516 5.55 -1.29753 1.07519 -1.37287 1.63358 4.16516 5.55 -1.2912 1.04267 -1.4027 1.5356 4.0077 5.57 -1.24894 1.04267 -1.4027 1.5286 4.40077 5.57 -1.24894 1.04264 -1.47527 1.4102 4.5747 5.59 -1.2481 1.01711 -1.71119 1.57065 4.5747 5.60	1	l .	1			
5.51 -1.53748 1.14200 -1.44766 1.78886 3.74894 5.57 -1.32713 1.12506 -1.47785 1.76128 3.84478 5.53 -1.317103 1.160286 -1.50677 1.73475 3.44834 5.54 -1.30716 1.09166 -1.54044 1.70867 4.05441 5.55 -1.27812 1.07587 -1.6016 1.45724 4.2047 5.56 -1.27894 1.04267 -1.64027 1.63566 4.40079 5.57 -1.27894 1.04267 -1.64027 1.63566 4.40079 5.57 -1.26121 1.01071 -1.71119 1.57965 4.5577 5.59 -1.26121 1.01071 -1.71119 1.57965 4.54167 5.59 -1.26121 1.01071 -1.71119 1.57965 4.5717 5.60 -1.25267 4.48196 -1.64897 1.52807 5.08870 5.61 -1.24431 .77230 -1.64897 1.52807 5.08870 5.62	i		1			1
5.52 -1.32713 1,12506 -1.47785 1.76425 3.84478 5.53 -1.31703 1,10828 -1.50877 1.73436 3.74634 5.54 -1.30716 1.07166 -1.54044 1.70567 4.06441 5.55 -1.27753 1.07517 -1.57287 1.65566 4.16074 5.56 -1.26121 1.03687 -1.64027 1.65566 4.40079 5.57 -1.24094 1.04264 -1.67527 1.61282 4.52641 5.57 -1.24097 1.02664 -1.67527 1.61282 4.52641 5.59 -1.24121 1.01071 -1.71119 1.57065 4.57167 5.60 -1.52566 -994718 -1.74566 1.54330 4.73583 5.61 -1.22431 977230 -1.76594 1.54530 4.73583 5.62 -1.22617 -440196 -1.64489 1.50843 5.24607 5.64 -1.22617 -440196 -1.64489 1.50843 5.24607 5.64 <td>5.50</td> <td>-1.34809</td> <td>1.15911</td> <td>-1.41814</td> <td>1.81733</td> <td>3.65498</td>	5.50	-1.34809	1.15911	-1.41814	1.81733	3.65498
5.53 -1.31703 1.10828 -1.50877 1.73456 3.44834 5.54 -1.30716 1.09166 -1.54044 1.70867 4.05461 5.55 -1.271783 1.07517 -1.57207 1.60558 4.16516 5.56 -1.26812 1.05587 -1.6016 1.65724 4.2047 5.57 -1.27694 1.04267 -1.6017 1.65767 4.40079 5.58 -1.26971 1.02664 -1.67527 1.6182 4.52641 5.59 -1.26121 1.01071 -1.71119 1.59065 4.55767 5.60 -1.52461 .94418 -1.74506 1.54830 4.73849 5.61 -1.24431 .779230 -1.76594 1.54830 4.73849 5.62 -1.22615 .745660 -1.62447 1.52807 5.08870 5.63 -1.22615 .748190 -1.62447 1.52807 5.08870 5.64 -1.22041 .922836 -1.90405 1.48741 5.4109 5.65	5.51	-1.53748	1.14200	-1.44766	1.78886	3.74894
5.54 -1.30716 1.09166 -1.54044 1.70867 4.05441 5.55 -1.29753 1.07519 -1.87287 1.60358 4.16516 5.56 -1.20812 1.05887 -1.60616 1.45724 4.2047 5.57 -1.27694 1.04267 -1.60616 1.63566 4.40077 5.57 -1.2497 1.02644 -1.67527 1.63566 4.40077 5.58 -1.24121 1.01071 -1.71119 1.59065 4.55767 5.60 -1.52566 .994918 -1.74606 1.54715 4.79487 5.61 -1.52561 .94918 -1.74606 1.54715 4.79487 5.61 -1.23613 .719230 -1.78594 1.54030 4.93643 5.62 -1.23613 .749405 -1.84891 1.58630 5.0870 5.63 -1.22613 .948195 -1.84891 1.58694 5.58416 5.64 -1.22619 .932836 -1.90407 1.45731 5.64407 5.64	5.52	-1.32713	1-12506	-1.47785	1.74125	5.84478
5.55 -1.29753 1.07519 -1.87287 1.60358 4.16516 5.56 -1.20812 1.05587 -1.60616 1.65724 4.2047 5.57 -1.27894 1.04267 -1.64027 1.65566 4.40079 5.58 -1.26997 1.02664 -1.67527 1.61262 4.52641 5.59 -1.26121 1.01071 -1.71119 1.5965 4.5747 5.60 -1.25266 .94418 -1.74506 1.54915 4.97487 5.61 -1.24431 .919230 -1.76594 1.54830 4.73643 5.62 -1.24431 .919230 -1.76594 1.54830 4.73643 5.62 -1.23617 .948196 -1.82407 1.52807 5.08870 5.63 -1.22617 .948196 -1.84487 1.56845 5.44091 5.64 -1.2361 .93838 -1.90605 1.44741 5.4108 5.65 -1.21627 .92410 -1.97204 1.45301 5.76581 5.67	5.53	-1.31703	1.10828	-1.50877	1.73456	3.94854
5.56 -1.20812 1.05687 -1.60616 1.5724 4.2047 5.57 -1.27594 1.04267 -1.64027 1.63566 4.40079 5.58 -1.26797 1.02664 -1.67527 1.61202 4.52641 5.59 -1.26121 1.01071 -1.71119 1.59065 4.5767 5.60 -1.32666 .994913 -1.74506 1.54915 4.79843 5.61 -1.24431 .979230 -1.76594 1.54830 4.73843 5.62 -1.22619 .948196 -1.82407 1.52807 5.08870 5.63 -1.212819 .948196 -1.84407 1.52807 5.08870 5.64 -1.22041 .932838 -1.90605 1.48741 5.4108 5.65 -1.21282 .917679 -1.48442 1.47093 5.52416 5.65 -1.20641 .902410 -1.97204 1.45301 5.76585 5.65 -1.21827 .50382 -2.03897 1.43501 5.76585 5.64	5.54	-1.30716	1.09166	-1.54044	1.70867	4.05461
5.57 -1.27594 1.04267 -1.4027 1.63566 4.40079 5.58 -1.26977 1.02664 -1,67527 1.61282 4.52641 5.59 -1.26121 1.01071 -1.71119 1.59065 4.55767 5.60 -1.32466 .794718 -1.74506 1.54830 4.73843 5.61 -1.24431 .779230 -1.76574 1.54830 4.73843 5.62 -1.23613 .746360 -1.82447 1.52807 5.08270 5.63 -1.22013 .746360 -1.82447 1.52807 5.08270 5.64 -1.22041 .948196 -1.84481 1.50845 5.84108 5.64 -1.20641 .948196 -1.94605 1.48741 5.4108 5.65 -1.21282 .917677 -1.74842 1.47093 5.58416 5.65 -1.216421 .902410 -1.97204 1.43361 5.75585 5.67 -1.19617 .887334 -2.05897 1.43361 5.75585 5.64 <td>5,55</td> <td>-1.29753</td> <td>1.07519</td> <td>-1.57189</td> <td>1.46358</td> <td>4.16516</td>	5,55	-1.29753	1.07519	-1.57189	1.46358	4.16516
5.58 -1.26977 1.02664 -1.67527 1.61282 4.52641 5.59 -1.26121 1.01071 -1.71119 1.59065 4.65767 5.60 -1.25266 .994913 -1.74506 1.54630 4.73843 5.61 -1.24431 .979230 -1.76594 1.54630 4.73843 5.62 -1.22615 .46560 -1.82487 1.52887 5.88270 5.63 -1.22617 .448196 -1.84487 1.50848 5.24407 5.64 -1.22041 -932838 -1.90605 1.48741 5.41108 5.65 -1.21282 .917677 -1.44842 1.47093 5.65416 5.66 -1.20541 .902410 -1.97204 1.45301 5.74555 5.67 -1.19517 .567328 -2.05497 1.43561 5.74555 5.67 -1.19617 .57322 -2.05497 1.43561 5.75555 5.67 -1.19411 .872537 -2.05497 1.46735 6.36664 5.70	5.56	-1.28512	1.05887	-1.60616	1.45924	4.28047
5.59 -1.26121 1.01071 -1.71119 1.59065 4.55767 5.60 -1.25266 .994913 -1.74806 1.56915 4.79489 5.61 -1.24431 .979230 -1.76594 1.54630 4.73843 5.62 -1.23615 .468660 -1.82407 1.52807 5.08570 5.63 -1.22519 .488196 -1.84407 1.50845 5.24409 5.64 -1.22041 -932836 -1.90605 1.49741 5.4108 5.65 -1.21282 .917673 -1.745842 1.47093 5.58416 5.66 -1.20541 .902410 -1.97204 1.45301 5.76586 5.67 -1.19517 .807331 -2.08497 1.43561 5.75586 5.67 -1.19411 .872539 -2.08329 1.41873 6.15744 5.69 -1.19411 .872531 -2.18106 1.40235 6.0664 5.70 -1.1940 .822731 -2.18106 1.40235 6.0664 5.71	5.57	-1.27894	1.04269	-1.64027	1.63566	4.40079
5.59 -1.24121 1.01071 -1.71119 1.59065 4.55767 5.60 -1.25266 .994913 -1.74806 1.54915 4.79489 5.61 -1.24431 .979230 -1.78594 1.54830 4.73843 5.62 -1.23615 .463660 -1.82407 1.52807 5.08870 5.63 -1.22619 .484906 -1.84407 1.52807 5.08870 5.64 -1.22041 -932838 -1.90605 1.48741 5.4168 5.65 -1.21282 .917673 -1.74882 1.47093 5.58416 5.65 -1.20541 .902410 -1.97204 1.45301 5.76586 5.67 -1.19517 .567331 -2.08497 1.43561 5.75416 5.66 -1.19111 .672539 -2.08329 1.41873 6.15744 5.67 -1.18421 .657427 -2.18106 1.40235 6.5664 5.70 -1.1748 .542573 -2.18104 1.40235 6.5664 5.71	5,58	-1.26997	1.02664	-1.67527	1.61282	4.52641
5.60 -1.25266 .994913 -1.74866 1.56915 4.79489 5.61 -1.24431 .979230 -1.78594 1.54830 4.93843 5.62 -1.23615 .948660 -1.82487 1.52897 5.08870 5.63 -1.22819 .948196 -1.84489 1.50843 5.24609 5.64 -1.22041 .932838 -1.90605 1.48741 5.41108 5.65 -1.21282 .917617 -1.48482 1.47095 5.58416 5.65 -1.21282 .917617 -1.48482 1.47095 5.58416 5.66 -1.20541 .902410 -1.97204 1.45301 5.7655 5.67 -1.19617 .887322 -2.08327 1.43561 5.75541 5.67 -1.19617 .872324 -2.08329 1.41873 6.15744 5.65 -1.1911 .872339 -2.18004 1.4073 6.8664 5.70 -1.17748 .842373 -2.18004 1.51972 6.87107 5.71	5.59		ł .			i
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5.62 -1.23615 .483660 -1.82487 1.52807 5.0840 5.63 -1.22819 .448196 -1.84489 1.50843 5.24409 5.64 -1.22041 .932836 -1.90405 1.48741 5.4108 5.65 -1.21282 .917577 -1.48421 1.47093 5.58416 5.66 -1.20541 .902410 -1.97204 1.45301 5.76585 5.67 -1.19817 .887381 -2.03497 1.45361 5.76574 5.66 -1.19111 .872339 -2.08329 1.41873 6.15744 5.67 -1.18421 .857427 -2.18106 1.40235 6.36064 5.67 -1.1746 .842593 -2.18036 1.38443 6.59107 5.70 -1.1746 .842593 -2.18036 1.38445 6.59107 5.71 -1.16449 .813139 -2.28302 1.3504 7.07290 5.72 -1.16449 .813139 -2.28302 1.3504 7.07290 5.73						
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$\begin{array}{cccccccccccccccccccccccccccccccccccc$	5.66	-1.19111	.872339	~ 2.08329	1.41873	6,15744
5.71 -1.17090 .827631 -2.28382 1.87102 4.82554 5.72 -1.16449 .813139 -2.28382 1.35404 7.07290 5.73 -1.15824 .796512 -2.33618 1.34151 7.33415 5.74 -1.15213 .783947 -2.37441 1.32741 7.61631 5.75 -1.14618 .764440 -2.45263 1.31572 7.70253 5.76 -1.14037 .754987 -2.57243 1.30044 8.21206 5.77 -1.15471 .740566 -2.57545 1.28756 6.54029 5.76 -1.12918 .726233 -2.64031 1.27506 8.88875 5.79 -1.12380 .711924 -2.70766 1.26273 9.25109 5.80 -1.11856 .697656 -2.77765 1.25117 9.65319 5.81 -1.11845 .680427 -2.85045 1.2376 10.0731 5.82 -1.10847 .669232 -2.92623 1.22870 10.5211 5.83 <td>5.69</td> <td>-1.18421</td> <td>.657427</td> <td>-2.13106</td> <td>1.40235</td> <td>6.95064</td>	5.69	-1.18421	.657427	-2.13106	1.40235	6.95064
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	5.70	-1-11748	.842593	-2.15036	1,38645	4.59107
5.73 -1.15824 .796512 -2.33618 1.34151 7.33415 5.74 -1.15213 .783947 -2.57441 1.32741 7.61031 5.75 -1.14618 .764440 -2.45263 1.31372 7.90253 5.76 -1.14037 .754987 -2.51293 1.30044 8.21206 5.77 -1.15471 .740564 -2.57545 1.26756 6.54029 5.78 -1.12918 .726233 -2.64031 1.27506 8.88875 5.79 -1.12380 .711924 -2.70766 1.26273 9.25109 5.80 -1.11856 .647656 -2.77765 1.25117 9.65219 5.81 -1.11845 .663427 -2.63045 1.2517 9.65219 5.82 -1.10847 .66922 -2.72623 1.7267 10.5211 5.83 -1.10847 .66922 -2.00519 1.21798 10.5211 5.84 -1.09890 .640924 -3.08766 1.20759 11.5117 5.85	5.71	-1.17090	.827631	-2.23124	1.37102	6.82554
5.74 -1.15213 .763947 -2.59441 1.52741 7.61031 5.75 -1.14618 .764440 -2.45265 1.31372 7.90253 5.76 -1.14037 .754987 -2.51293 1.30044 8.21206 5.77 -1.15471 .740564 -2.57545 1.26756 6.54029 5.78 -1.12918 .726233 -2.64031 1.27506 8.88875 5.79 -1.12380 .711924 -2.70766 1.26273 9.25107 5.80 -1.11856 .647656 -2.77765 1.25117 9.65219 5.81 -1.11845 .663427 -2.65045 1.25117 9.65219 5.82 -1.10847 .66922 -2.72623 1.2267 10.5211 5.83 -1.10847 .66922 -2.00519 1.21798 10.5211 5.84 -1.09890 .640924 -3.08768 1.20759 11.5117 5.85 -1.09431 .626525 -3.17354 1.19752 12.0606 5.85	5.72	-1.16449	.618134	-2.28382	1.35604	7.07290
5.75 -1,14618 .764440 -2,45268 1,81372 7,40258 5.76 -1,14037 .754987 -2,51293 1,30044 8,21206 5.77 -1,15471 .740564 -2,57545 1,28756 6,54029 5.78 -1,12418 .726233 -2,64031 1,27506 8,88575 5.79 -1,12380 .711924 -2,70766 1,26273 9,25709 5.80 -1,11856 .647656 -2,77765 1,25117 9,65219 5.81 -1,11845 .663427 -2,83045 1,25117 9,65219 5.82 -1,10847 .669212 -2,72623 1,2807 10,5211 5.83 -1,10847 .669212 -2,72623 1,2807 10,5211 5.83 -1,10847 .669212 -2,02519 1,21798 10,9918 5.84 -1,09890 .640914 -3,08758 1,20759 11,5117 5.85 -1,09431 .626525 -3,17354 1,19752 12,0606 5.86	5.73	-1.15824	.776512	- 2.33818	1.34[5]	7.38415
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5.76 -1.14037 .75.4987 -2.51293 1.30044 8.21206 5.77 -1.15471 .740566 -2.57545 1.28756 6.54029 5.76 -1.12418 .72.6233 -2.64031 1.27506 8.58875 5.79 -1.12380 .711924 -2.70766 1.26273 9.25709 5.80 -1.11856 .671656 -2.77765 1.25117 9.65319 5.81 -1.11845 .685427 -2.65045 1.24776 10.0731 5.82 -1.10847 .665427 -2.65045 1.22870 10.5211 5.83 -1.10847 .64932 -8.00519 1.21798 10.5211 5.84 -1.09890 .640924 -3.08758 1.20759 11.5117 5.85 -1.09431 .626525 -5.17354 1.19752 12.0406 5.86 -1.08550 .598672 -3.25747 1.17831 13.2826	5.75	-1.14418	.769440	-2.45268	1.31372	7.90253
5.77 -1.15471 .740564 -2.57545 1.28756 6.54029 5.76 -1.12410 .72.6233 -2.64031 1.27506 8.88875 5.77 -1.12380 .711924 -2.70766 1.20273 9.25707 5.80 -1.11856 .697656 -2.77765 1.25117 9.65219 5.81 -1.11845 .685427 -2.65045 1.24776 10.0731 5.82 -1.10847 .669232 -2.92623 1.22870 10.5211 5.83 -1.10562 .653069 -5.00519 1.21798 10.9998 5.84 -1.09890 .640924 -3.08758 1.20759 11.5117 5.85 -1.09431 .626525 -5.17354 1.19752 12.0406 5.86 -1.08984 .612787 -3.26342 1.18776 12.6495 5.87 -1.00550 .598672 -3.35747 1.17831 13.2826	5.74	-1.14037			1.30044	
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5.86 1.08128	1	}		1	1.17631	13-2826
	5.88	1.0812B	.584623	-3.45599	1.16916	13.9644

W.A.C.A. Technical Note No.652

TABLE I (concluded)

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$\left(\frac{L}{J}\right)_{ef}$	c	$\frac{\underline{s''}}{\left(\frac{\underline{E}\underline{I}}{L}\right)}$	S (EI)	C²	S ² C ² (<u>E I</u>) ²
5.89	-1.07716	0.570587	-3.55938	1.16051	14.6998
5.90	-1.07317	.554562	- 8. 66787	1.15174	15.4746
5.91	-1.06932	.542546	-8.78201	1,14345	16.3555
5.92	-1.06557	.528535	-3.90222	1.13544	17.2878
5.93	-1.06193	.\$14527	-4.02902	(. 12771	18,3061
5.44	-1.05841	.500518	-4.16298	1.12023	19-4140
5.95	-1.05500	.486507	-4.30474	1.11502	20.6250
5.96	-1.05169	.472491	- 4.45502	1.10606	21.9521
5.97	-1.04850	.456466	-4.61463	1.09935	28.4405
5.98	-1.04541	.444431	-4.78450	1.07287	25.0178
5.99	-1.04244	.430382	-4.96569	1.08667	26.7953
6.00	-1.03956	.416317	-5.15938	1.08069	28.7471
6.01	-1.03680	.402234	-5.36694	1.07495	30.7628
6.02	-1.03413	.388129	-5.58995	1.06948	53.4171
6.03	-1.03158	.373999	-5.83026	1.06415	34.1724
6.04	-1.02912	.359843	-6.08996	1.05909	39.2790
6.05	-1.02677	.845658	-6.37157	1.05425	42.7993
6.06	-1.02452	.331441	- 6.67802	1.04763	46.8098
6.07	-1.02236	.317189	-7.01282	1.04523	51.4041
6.08	-1.02051	.302899	-7.38013	1.04104	56.7018
6.09	-1.01637	.288570	-7.78502	1.03707	62.5631
6.10	-1.01651	.274197	-8.23357	1.03330	70.0444
6.11	-1.01476	.259780	-6.75351	1.03975	78.5430
6.12	-1.01311	.245314	-9.29412	1.02639	88.6607
6-13	-1.01156	.230797	-9.92736	1.02325	100.844
6.14	-1.01010	216227	-10.6483	1.02031	115-488
6.15	-1.00574	.201600	-11.4768	1.01757	134.031
6.16	-1.00749	.186914	-12.4392	1.01503	157.056
6.17	-1.00632	.172166	-13.5707	1.01269	186.501
6.18	-1.00526	.157353	-14.9205	1.0(055	224.970
6.19	-1.00429	.142472	-16.5591	1.00860	276.565
6.20	-1.00342	.127521	-18.5908	1.00686	347.990
6.21	-1.00265	.112495	-21-1758	1.00\$3!	450.798
6.22	-1.00198	.0973934	-24.5774	1.00396	606.443
6.23	-1.00140	.0822115	- 29.2572	1.00251	858,858
6.24	-1-00095	.0669474	-86.1085	1.00185	1506-24
4,25	-1.00055	,0515970	-47-0647	1.00110	2217.51
6.26	-1.00027	.0361576	-47.4745	1.00054	4555.25
6.27	-1.00009	.0206258	-118.80€	1.00017	14117.2
6.28	100001	.00499841	-490.041	1.00001	240142
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TABLE II

C	TENSION							
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2. 497001 .751978 1.00103 .b4900Z .244665 3. .497760 .754488 1.00302 .24766 .244567 .244567 4. .476033 .757644 1.0058Z .244049 .14677 .247677 .245677 .14778 .101124 .241245 .447042 .147747 .247042 .147042 .245867 .147748 .101124 .241245 .447042 .245974 .245877 .245974 .245974 .24577 .245774 .24577 .247749 .24577 .247749 .24577 .247749 .24677 .247749 .10271 .227851 .247749 .10271 .227851 .247749 .10271 .22755 .247749 .106572 .27548 .245649 .246579 .10271 .257471 .22755 .247471 .106572 .27548 .247471 .106572 .27548 .247471 .106572 .27548 .247581 .247581 .247581 .247581 .247581 .247581 .247581 .247581 .247581	1 1		i	_	1			
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4.0 2.64221 1.33214 1.44921 .0807815 .164658 4.1 .278529 1.53466 1.46539 .0178783 .167818 4.2 .272967 1.37731 1.46820 .9745108 .165022 4.3 .267535 1.40009 1.50802 .0715749 .162771 4.4 .262234 1.42297 1.52805 .0687666 .160566 4.5 .257063 1.44597 1.54828 .0660815 .158407 4.6 .252022 1.46907 1.56670 .0635181 .154236 4.7 .247110 1.49225 1.58930 .0610631 .154238 4.8 .242324 1.51553 1.61008 .0567210 .152225 4.9 .247664 1.53509 1.63101 .0564843 .150260		-		· ·	.0876098			
4.1 .278529 [.35466 [.44659 .0775783 .[67318 4.2 .272967 [.3773] [.46820 .9745106 .[65022 4.3 .267555 [.40009 [.50802 .0715749 .[6277] 4.4 .262234 [.42297 [.52805 .0687666 .[60566 4.5 .257063 [.44597 [.54528 .0660815 .[58409 4.6 .252022 [.46907 [.56670 .0635151 .[56300 4.7 .247110 [.49225 [.58930 .0610631 .[54238 4.8 .242324 [.51553 [.61008 .0587210 .[62225 4.9 .247664 [.53509 [.6310] .0564843 .[50260	3.9	.290042	1.30976	1.43007	.0841242	.172042		
4.2 .272967 1.37731 1.48820 .8745108 .185022 4.3 .267535 1.40009 1.50802 .0715749 .162771 4.4 .262234 1.42297 1.52805 .0687666 .160566 4.5 .257063 1.44597 1.54528 .0660815 .158409 4.6 .252022 1.46907 1.56670 .0635151 .154238 4.7 .247110 1.49225 1.58930 .0610631 .154238 4.8 .242324 1.51553 1.61008 .0587210 .152225 4.9 .247664 1.53509 1.63101 .0564843 .150260	4.0	.284221	1.33214	1.44921		.167652		
4.3 .247535 1.40009 1.50802 .0715749 .162771 4.4 .262234 1.42297 1.52805 .0687666 .160566 4.5 .257063 1.44597 1.54528 .0660815 .158409 4.6 .252022 1.46907 1.56870 .0635151 .156300 4.7 .247110 1.49225 1.58930 .0610631 .154238 4.8 .242324 1.51553 1.61008 .0587210 .182225 4.9 .227664 1.53509 1.63101 .0564843 .150260	4.1	.278529	1.35466	1.46859	.0175783	. [673] 8		
4.4 .262234 1.42297 1.52505 .0687666 .160566 4.5 .257063 1.44597 1.54528 .0660815 .158409 4.6 .252022 1.46907 1.56870 .0635151 .156300 4.7 .247110 1.49225 1.58930 .0610631 .154238 4.8 .242524 1.51553 1.61008 .0587210 .152225 4.9 .247664 1.53509 1.63101 .0564843 .150260	4.2	.272967	1.37731	1.46820	.0745106	.165022		
4.5 .257063 i,44597 [.54528 .0660815 .158409 4.6 .252022 1.46907 1.56870 .0635151 .156300 4.7 .247110 1.49225 1.58930 .0610631 .154238 4.8 .242324 1.51553 1.61008 .0587210 .152225 4.9 .237664 1.53509 1.63101 .0564843 .150260	4.3	.267535	1.40009	1.50802	.0715749	.162771		
4,6 .252022 !.46907 !.56870 .063515! .156300 4.7 .247110 !.49225 !.58930 .0610631 .154238 4.8 .242324 !.51553 !.61008 .0587210 .152225 4.9 .227664 !.53809 !.63101 .0564843 .150260	4.4	.262234	1.422.97	1.62805		.160566		
4.7 .247110 [.49225 [.58930 .0610631 .154238 4.5 .242324 [.51553 [.61008 .0587210 .152225 4.9 .227664 [.53809 [.6310] .0564843 .150260	4.5	.257063	1,44597	1.54528	.0460815	.158409		
4.5 .242324 1.51553 1.61008 .0587210 .152225 4.9 .237664 1.53809 1.63101 .0564843 .150260	4.6	.252022	1.46907	1.56870	.9635151	.156300		
4.9 ,237664 1.53869 1.63101 ,0564843 .150260	4.7	.247110	j.49225	1.55930	.0610631	.154238		
	4.5	.242324	1.51553	1.61008	.0567210	.152225		
5.0 .200128 1.56232 1.65211 .0540486 .148040	4.9	.237664	1.53569	1.63101	.0564843	.150260		
	5.0	.255/28	1.56232	1.65211	.0543486	.148343		

TABLE II (continued)

					2002
1/上)		5"	<u>s</u>	C²	S ² C ²
\ J / cc	C	(EI)	(<u>ĒI</u>)	٠	(EI)2
` 'eff		<u> </u>	\		()
5.1	.228713	1.58583	1.67936	0523097	146435
5,2	.224415	1.60940	1.69476	.0103634	,144654
5.3	.220239	1.68804	1.71629	.0485064	.142880
5.4	.216176	1.65674	1.73795	.0467319	.141158
5.5	.212224	1.68049	1.75974	.0450356	.139472
5.6	.205381	1.70429	1.78166	.0434225	.137836
5.7	.204645	1.72814	1.50348	.0418794	.136245
5.5	.201012	1.75204	1.82582	.0404059	.134698
5.9	-197481	1.77599	1.84806	.0389987	.133173
6.0	.194048	1.79997	1.87040	.0376547	.(2173)
6.1	.190711	1.82400	1.87284	.0363706	.180310
6.2	.187466	1.84806	1.91537	.0351437	.128930
6.3	.184312	1.67215	1.43749	.0339710	-127688
6.4	.181245	1.89628	1.96069	.0328499	.iz428f
6.5	.178264	1.92044	1.98348	.0517799	.125020
6.6	.175364	1.94463	2.00653	.0501526	·123771
6.7	.172544	1.96885	2.02927	.0297715	.122597
€.5	.169802	1.99810	2.05227	.0258326	.121438
6.9	.147134	2.01737	2.07534	.#179356	.120312
7.0	.16 4539	2.04166	2.09847	.0170730	317218
7.}	.162013	2.06598	2.12167	.0162484	.118157
7.2	.159556	2.09031	2.14493	.0254582	.117125
7.3	.157144	2.11448	2.16524	.0147007	.116124
7.4	.154836	8.15906	2.19160	.0239743	-115151
7.5	.152.570	2.16346	2.21502	.6232775	.114207
7.6	.150363	2.18788	2.23849	.0226089	-1:3269
7.7	.148213	2.21231	2.26200	.0219471	,112.316
7.8	.146119	2.23676	2.2556	.021\$507	.111532
7.9	.144079	2.26123	2.30917	.0207586	.110690
8.0	.142090	2.28571	2.53251	.0201897	.109872
8.1	.140152	2.31021	2.35650	-0196427	.109078
8.2	.135263	2.83472	2.36022	.0191167	.108305
8.3	.186421	2.35925	2.40399	.0186107	.107554
8.4	.134625	2.38176	2.42778	.0151238	-106824
5.5	,132872	2.40833	2.45162	.0176850	.106114
8.6	.131162	2.45289	2,47548	,9172035	.105423
8.7	.129494	2.45747	2.49938	.0167686	.104752
8.8	.127865	1.48205	2.52331	.0163495	.184098
8.9	.126275	1.50665	2.54726	.0159454	.108462
9.0	.124722	2,53125	2.67125	.0185557	,102843
9.1	.123206	2.55556	2,54526	.0151797	.108241
7.2	.121724	2.58049	2.61730	.0148169	.101654
9.5	.120277	2.40512	2.64386	.0144666	.101063
9,4	.118842	2.62976 2.65441	2.66745	.0141283	,100527
9.5	.117480		2.4156	.0135015	.0979848
9.6	.116128	2.57907	ł '	1	1
9.7	.114606	2.70374	2.73985	(0131804	.0787421
9.8	.] (35 (3	2.72841	2.76402	.0128852	.0979515
9.9	.112248	2.75309	2.78822	.0125996	.0474515

TABLE II (continued)

(L) eff	С	<u>S"</u> (<u>EI</u>)	<u> </u>	C²	S2C2 (EI)2
V ETT		(L)	()		(T)
10.0	0.111010	2.77778	2.81244	0.0125258	0.0974746
1.01	.109799	2.50247	2.43667	.0120558	.0970094
10.2	.108613	2.52717	2.8609Z	.0117948.	.0965887
10.3	.107452	2.65188	2.56519	.0115460	.0461139
10.4	.106316	2.87668	3.90948	,0113050	.0956810
10.5	.105202	2.90132	2.93379	.0110675	.0952592
10.6	,104112	2.92604	2.958(1	.0108392	.0948475
10.7	.105043	2.95077	2,98244	.0106179	.0944454
10.8	.101996	2.97551	5.00679	.0104032	.0940527
10.9	.100969	5.00025	3,43115	.0101948	1740270.
11.0	.0999433	3.02500	3.05553	.00717265	.0932942
11.1	.0989767	3.04975	3.07972	.00779638	.0927274
11.2	.0760092	3.07451	3.10433	.00768580	.0925698
11.3	.0970602	5.09927	1.12875	.00942069	.0912196
11.4	.0961295	3.12404	3.15315	.00924084	.0918778
11.5	.0952169	3.14881	3.1776Z	.00906607	.0915424
11.6	.0943196	3.17358	5.20207	.00867618	.0112148
11.7	.0934398	3,19836	3.22654	.00873100	.6908943
11.6	.0925762	3.22315	3.25(0)	.00887036	.0905606
11.9	.0917283	3.24794	3,27550	.00541405	.0902736
12.0	.0908957	3.27273	3.29999	.00825208	.0899730
12.1	.0900780	3.29752	3.32450	.00811404	.0896787
12.2	.0892748	3.32232	3.34901	.00796998	.0893904
12.5	.0654657	8.34712	5.37354	.00782971	1801980.
12.4	.0877103	5.37193	3.37807	.00747310	-0888314
12.5	.0849484	3.39674	8.42261	.00756008	.085\$603
12.6	.0861996	3.42155	3.44717	.00748037	.0882947
12.7	.0854635	3.44637	3.47172	.00730400	.0550342
12.8	.0847398	3.47119	3.49629	.00718983	.0877789
12.9	.0649282	3,49601	3.52087	.00704074	.0575285
15.0	.0833284	3.52083	3.54545	.00694343	.0872830
13.1	.0826402	3.54566	\$.57004	.09482940	.0870421
13.2		3.57049	3.59464	1	
1 1	.0819632	1	ł	.00471797	.0868058
15.3	.0812972	3.59583	3.61926	.00468923	.0865739
13.4	.0806419	3.62016	3.64386	.00450311	.0862464
	.0799970	3.64500	3.66848		,0841230
13.6	.0793624	3.66784	3.67310	.00629539	.0869036
13.7	.0787377	3.69469	3.71773	.00619965	.0854885
13.8	.0781228	3.71953	3.74237	.00610317	.6084971
13.9	.0775174	3.74435	3.76702	.00400855	.0552694
14.0	.0769213	3.76913	3.79167	.00891688	.0859654
14.1	.0763343	3.79408	3.61632	.00582692	.0845651
14.2	.0757561	3.61894	3.54098	.00673899	,0846681
14.5	.0751866	3.84350	3.86565	.00565303	.0814746
14.4	.0746257	3.86866	3.89032	.00556899	.0842845
14.5	.0740730	3.89352	3.91500	.00548681	.0840975
146	.0785284	3.71838	3.93968	.00540648	.0837137
14.7	.0729918	5.94325	3.96437	.00532780	.0837330
14.6	.0724630	5.96812	3.98906	.005Z5088	.0835553
14.9	.0719417	3.99299	4.01376	.00517561	.086659.
15.0	.0714279	4.01786	4.03846	.00510195	.0832085

TABLE II (continued)

(누)	C	5" /FT\	S (EI)	C²	S2 C2 /EI\2
() Jeff)	(탄)	(モ)		(단) _]
15.1	.0709214	4.04278	4.06317	.00501984	.0530594
15.2	.0704220	4.06761	4.08768	.00495926	.0828724
15.3	.0699296	4.09248	4.112.59	.40489015	.#827091
15.4	.0694440	4.11736	4.13731	.89452247	.0825480
į 5.5	.0689651	4.14224	4.16204	,00475619	.0623473
15.6	.0684928	4.16712	4.16676	.90469126	.0611331
15.7	.9680269	4.19201	4.21150	.00462766	.0520794
15.8	.0675673	4.21689	4.23623	.00456534	.8819150
15.9	.0671138	4.24175	4.26097	.00450427	.0617787
16.0	.066664	426667	4.25571	.00444441	.0816321
16.L	.0662249	4.29156	4,31046	.60436574	.8814874
16.2	,0657893	4.51645	4.33521	,00431515	.0813450
16.5	.0653575	4.84184	4.35176	.00427184	.0812046
16.4	.0649349	4.36623	4,38472	.00421654	.0810644
16.5	.0645160	4.39113	4.40948	.004/625	.0809361
16.6	.0441024	4.41608	4,43415	.004:04:2	.0007454
16.7	.0686941	4.44092	4.45901	.00405694	.0806684
16.8	.0432910	4.46582	4.46378	.00400575	.0805380
16.9	.0628930	4.49072	4.50856	.00395543	.0804048
17.0	.0624999	4.51562	4.53333	.09390624	.0802175
17.1	.0621117	4,54053	4.55811	.00385767	.0801524
17.2	.0417263	4.56843	4.58287	.00381939	.0500292
17.5	.0613496	4.59034	4.60765	.00376378	.0799077
17.4	.0609756	4.61524	4. 53247	.00371802	.0797676
17.5	,0606060	4.64015	4.65726	.00347399	.0796695
17.6	.0602469	4.64506	4,65205	.00562877	.0795526
17.7	.0598802	4.48997	4.70685	.00358584	.0794377
17.6	.0895238	4.71458	4.73165	.00354308	.0793241
17.9	,0591716	4.73979	4.75645	.00350127	.0792(2)
18.0	.0555235	4.76471	4.78125	.00546020	0791015
16.1	.0584793	4.75962	4.80606	.00341985	.0749723
18.2	.0881395	4.81458	4.83086	.00336020	.0788846
18.3	.0578034	4.83945	4.85567	.00334124	.0787783
18.4	.0574712	4.86437	4.88049	.00830294	.0786753
16.5	.0571428	4.55727	4.90530	.00226530	.0785697
18.6	.0568182	4.91420	4.93012	.00322830	.0784474
10.7	.0564972	4.93912	4.75474	.003/9193	.0783664
18.8	.0561798	4.96405	4.97976	00315617	.8782667
18.9	.0558659	4.95897	5.00459	.003/2/00	0781682
19.0	.055555	5.01389	5.02941	.00308642	.0780709
19.1	.0552486	5.03881	5.05424	.00308241	.0779748
19.2	.0549450	5.06374	5.07907	.00301896	-0176799
19.3	.0546448	5.08866	5,10390	.00295605	.0777661
19.4	.0543478	5.11359	5.12874	.00245369	.0776985
19.5	.0540540	5.13851	5.15357	.00292184	.0776020
19.6	.0537634	5.16344	5.17841	.00289051	.0775116
19.7	.0534759	5.15537	5.20325	.60285968	.0774223
19.8	.0531915	5.21530	5.22809	.00282933	.0773540
19.9	.0529100	5.23623	5.25293	.00279947	.0772467
•	,	•	•	•	•

TABLE II (concluded)

(b)	c	$\frac{S''}{\left(\frac{EI}{L}\right)}$	S (EI)	C*	S*C* (£I)*
20	0.0526816	5.26816	5.87778	0.00277008	0.077/605
21	.0500000	5.51250	5.52432	.00250000	.0763504
22	.0476190	5.76190	5.77509	.00226757	.0756250
23	.0454545	6.01136	6.02361	.00206612	.0749716
24	.0434753	6.26087	6.27273	.00189054	.074389%
25	.0416667	6.51042	6.52174	.00173611	.4738422
26	.0400000	6.76000	6.97083	.00160000	.e733507
27	.0384615	7.00962	7.02000	.00147929	.0729000
2.8	.0370370	7.25926	7.26923	.00137174	.0724862
2.9	.0357143	7.50893	7.51852	.00127741	.0721082
30	.0344828	7.75862	7.76786	.00118906	.0717474
31	-033333	8.00835	8.01724	.00111111	.9714180
52	.0322561	8.2550	8.26664	.00104058	1111170.
33	.0312500	8.50781	8.51613	.000976563	.0708247
34	.0308930	8.75758	8.74563	.000918274	-0705566
35	.0294118	9.00735	9.01515	.000865062	.0703053
36	.0285714	7.25714	9.26471	.000816326	.0100692
37	.0277778	9.50694	9.51429	.00077160€	.0695469
38	. 0 270 270	9.75676	7.76387	.000730460	.8676374
39	.0263158	10.0066	10.0125	.000692521	.0694374
40	.0256410	10.2564	10.2632	.000657462	.0692521
41	.0250000	10.5063	10.5128	.000626000	.0690746
42	.0243902	10.7561	10.7625	.000594884	.0687063
43	.0258095	11.0060	11.0122	.000564893	.0687465
44	.0232558	(1.2556	11.2619	.000546833	.0685941
45	.0227273	11.5057	11.5116	.000516529	.0664492
46	.0122722	11.7556	11.7614	.000493827	.0188810
47	.0217391	12.0054	12.0111	.000472570	.0681790
48	.0212766	12.2553	12.2609	.000452694	.0680519
49	.0208333	12.5052	12.5106	.000454028	.0679323
50	.0204-052	12.7551	12.7604	.000416493	.0478168